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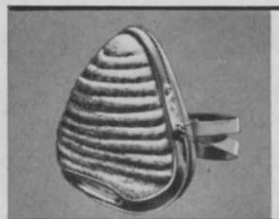

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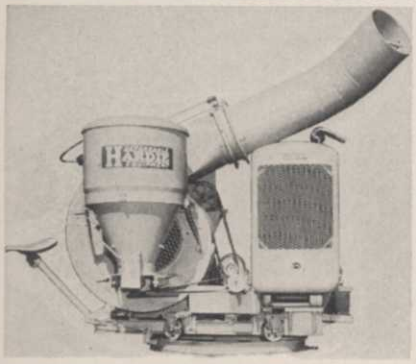

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WEEDS and TURF
PEST CONTROL
A SECTION OF PEST CONTROL MAGAZINE

January, 1963

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Go national?

Do contract applicators need a national organization?

Certainly urban/industrial sprayers of weeds, turf, ornamentals, and trees are witnessing the industry's "coming of age" this year.

Advent of *Weeds and Turf* brought contract applicators their first national trade magazine.

Public furor over pesticides this year is generating increased demand for professional, diligent operators.

Maybe it's time for a nationwide organization of spraymen.

After our announcement last month that the Horticultural Spraymen's Association of Florida wants to go national, we received letters from all over the country commenting on the endeavor. Most remarks were favorable, because spraymen feel this multi-billion dollar industry must unite to tell its important story to the public, to lawmakers, even to suppliers.

Through a national organization industrymen can band together to improve ethics, and to sponsor research.

One sure way to upgrade any industry is to get the leaders together to inspire each other to greater awareness of ethical operations and logical pricing.

There are thousands of businessmen in this country, some large, some small, who devote their energy to responsible application of weed control and turf care chemicals. Unfortunately, in some areas, the public isn't yet aware of the high caliber of these firms. *Weeds and Turf* can speak nationally to the industry itself, but it takes a national trade association to carry an industry image to the public as a whole.

If America's spraymen can lay down their differences and pool talents for the betterment of applicators everywhere, 1963 can truly be a year of achievement.

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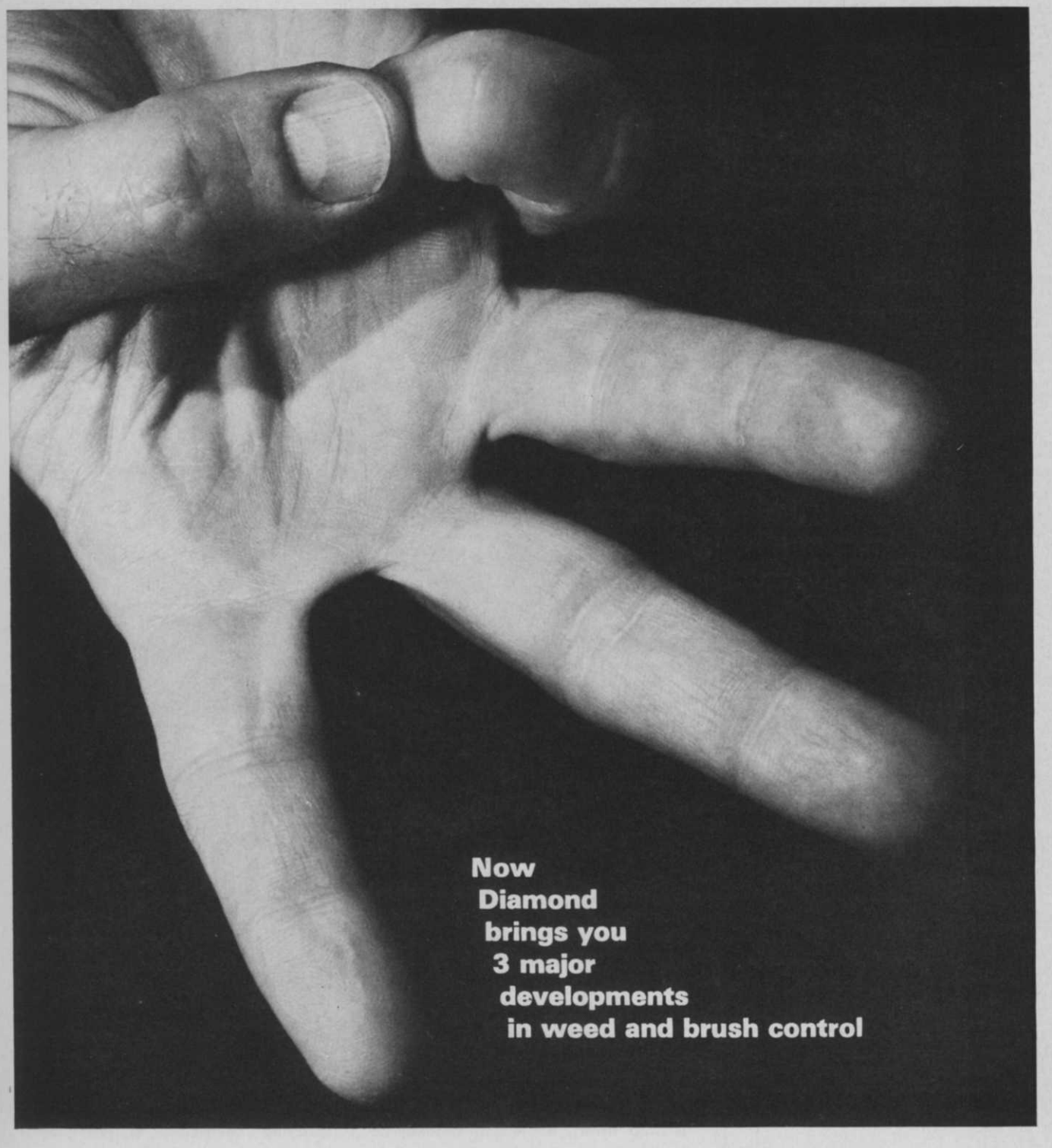

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weed and brush killer is a DIAMOND exclusive. Unique in that it combines the safety of amines and the killing power of esters. All the advantages . . . yet with none of the disadvantages. Offers greatest safety for use adjacent to susceptible crops. Penetrates plant cuticles to kill efficiently, effectively, from foliage to roots.

FOR MORE DETAILS ABOUT THESE AND OTHER DIAMOND PRODUCTS, WRITE DIAMOND ALKALI COMPANY, 300 UNION COMMERCE BUILDING, CLEVELAND 14, OHIO

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LADDERS ARE VERTICAL

YOU use them to climb higher. And they put you right where you want to go. No wasted effort. No milling around. No straying from target.

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With *Weeds and Turf*, there's no wasted effort, no milling around, no straying from target. Readers of *Weeds and Turf* are all interested in how to control or enhance vegetation.

Who are these readers? Contract applicators, mostly, who spray weeds, turfgrass, and ornamentals for a living. They buy in bulk. They're knowledgeable. They're good businessmen.

Who else? Railwaymen, highwaymen, civic and state officials — but only those who're interested in controlling weeds or turf and ornamental pests. Nobody else. These men read *Weeds and Turf* because they're looking for sources of supply, and practical tips on how to do a job.

Do you make weed and ornamental pest control preparations, or turf spraying chemicals, or equipment? Have you been milling around, wasting effort, straying from target because your ads weren't reaching the men who do the buying?

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Write for free market data, rates, etc.

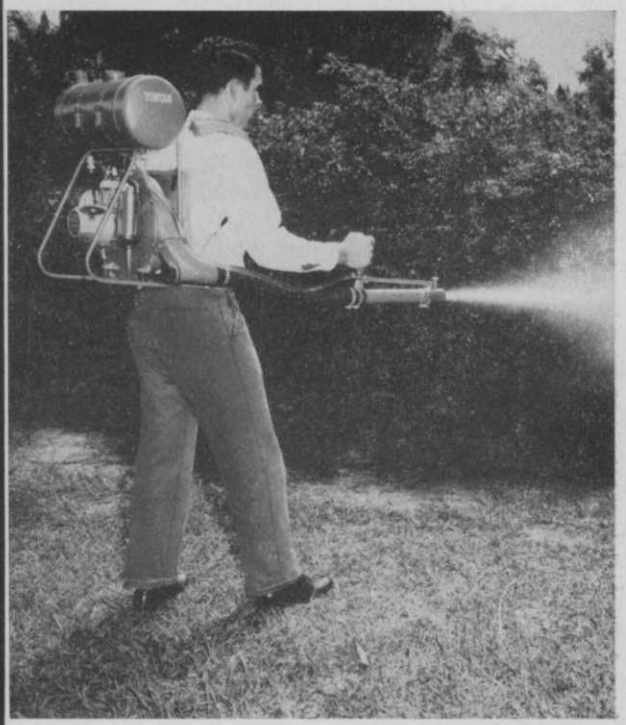
WEEDS and TURF
PEST CONTROL

TRADE MAGAZINES, INC., DEPT. C-1, 1900 EUCLID, CLEVELAND, O.

easy turf and weed control—

with a famous

FONTAN



THE R.5 FONTAN FOR HEAVY DUTY WEIGHT 37 LBS.

A self-contained unit, the Fontan has jets to interchange for misting or spraying, another attachment to interchange for dusting. Designed for versatility, dependability and safety, the Fontan has metal frame and padded straps for comfortable operation.

FONTAN + MALATHION = ECONOMY

The Fontan adjusts to allow low-volume spraying with less dilute liquid and a higher concentration of Malathion or other chemical. Both Fontans offer complete portability, choice of droplet size, easy maintenance, safe fuel injection, corrosion-resistant plated parts.

THE R.6 FONTAN FOR SMALLER JOBS WEIGHT 24 LBS.

A torch interchanged with the spray head and nozzle converts either Fontan into a flame thrower for weed killing, snow removal, burning off paint, heating tar for roofs and street repairs, and numerous similar tasks.

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SMCP Southern MILL CREEK PRODUCTS COMPANY, Inc.

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CAR-HAPPY Americans have prompted a revolution in travel, and following in the exhaust-fumes wake are economic booms which couldn't be predicated 40 years ago.

This country now boasts the most extensive, and most expensive, highway system in the world. Our vast maze of roadways are costly to maintain. A major side-effect of this roadbuilding spree is a tremendous new market for turf spraying, weed control, and brush elimination. During the next decade, this roadside spraying industry is expected to reach Herculean proportions, and contract applicators all over the country are bidding for their share of the business.

Weeds and Turf has just completed a major survey of weed control practices on state and federal highways. Data gathered in our investigations reveal a significant increase in the use of contract sprayers by state officials who prefer not to treat all their own roadways.

Opportunities for contract roadside spraying are varied. A partial breakdown of services they are performing includes the following:

(1) Soil sterilization around signposts, guardrails, etc.;

(2) Selective weed control through broadscale spraying;

(3) Broadscale brush control;

(4) Selective weed control in turf areas, either post-emergence selective spraying, or pre-emergence control of such turf pests as crabgrass;

(5) Fertilization of seeded areas (in some states, fertilizer is combined with selective weed-killers such as 2,4-D when turf is treated);

(6) Spraying growth retardants such as MH-30; and

(7) Spraying trees and ornamentals in landscaped areas along superhighways.

What selling points do CAs use to sell a chemical control program to county or state road officials? Why should those few states which now shy away from chemical treatment embark on this new avenue of maintenance? And why should states with limited spraying programs decide to increase use of chemicals?

Several good reasons are included in a booklet from the Connecticut Agricultural Experiment Station entitled, "Chemical Control of Weeds and Brush Along Roadsides."

Dr. John F. Ahrens, author of the pamphlet, maintains that chemical treatment enhances the safety, beauty, health, and economy of our highway systems. Improved visibility, better pedestrian walkways, and elimination of fire hazards are among the advantages Dr. Ahrens cites. He also points out that noxious weeds, such as ragweed and poison ivy, can be controlled economically by regular spraying.

More important to cost-conscious highway departments is the economy of chemical control versus mechanical mowing. Annual cost for roadside mowing in the U.S. is staggering, and states are desperately seeking a cheaper way to get the job done.

How are the states tackling this economic headache? Our survey shows that 44 out of 50 now have a chemical control program of some sort. Some of these are just getting underway, while others have been successfully in existence for several years.

Of the 44 states which use chemical methods, 35 report they have a well-organized, extensive roadside spraying program.

What is really significant to the readers of *Weeds and Turf* is that 43% of these states use contract applicators for all or part of their chemical roadside maintenance (Figure I). Here is a big, lucrative market waiting for the capable, aggressive, well-equipped company.

It is logical to expect an in-

Large, specially built spray rig used for spraying MH-30 on Eastern turnpike was constructed by the F. E. Myers and Bro. Co.

Highway study shows wid

Typical rural road is sprayed for brush control by a contract applicator. This is a franchise operator associated with the Vegetrol group.

Figure I

Analysis of Representative States Which Use Contract Applicators to Spray Roadside Weeds, Turf, Brush, Trees or Ornamentals

State	Miles Treated Annually	Number of Treatments Yearly	Percentage of Work Contracted Out	Average Cost Per Mile	Months Work Is Performed
Colorado	1000	one	20%	na*	April-June
Idaho	4000	two	100%	$30.00	Summer
Illinois	10,000	one	60%	16.00	April-September
Indiana	6000	two	66%	25.00	April-November
Iowa	8770	one	13%	28.00	May-July
Massachusetts	na*	na*	90%	na*	March-August
Michigan	1406	one	40%	25.00	Spring, fall
New Jersey	1015	three	95%	30.30	April-September
Ohio	11,763	two	65%	18.00	February-August
Pennsylvania	14,000	two	24%	21.00	May-September
Rhode Island	na*	one	90%	.015/ft	April-August
Wisconsin	1900	two	100%	60.00	May-August
Wyoming	5307	two	50%	na*	na*

These are not all the states which use contract applicators. In cases where figures were inconclusive, unavailable, or indeterminable, listing has been omitted. To interpret this data usefully, compare with Figure II. Only state which did not reply at all was Missouri. *na: not available.

use of custom sprayers

crease in contracted highway spraying in the next few years, as spraymen become more and more adept at their trades, gain valued experience and equipment, and recruit and train capable personnel.

Public opinion, moreover, may demand that tomorrow's chemical applicator be a trained, licensed, insured professional who can guarantee results, and provide safeguards. Men whose fulltime business is outdoor spraying with pesticides are in a better position to placate the public's fear of chemicals than are state workers who may have a variety of duties.

Reasons for using contract applicators are varied, but the most immediately obvious one is cost. According to our survey, average cost per mile for contract application is $28, while average for state-performed work is $65.

Fees for contract spraying ranged from $17 to $60 per mile, while state-performed treatments cost from $12 to $400 per mile. It's probable that the $400 figure includes additional operations of some kind.

Applicators who want to sell their county or state a highway spraying program can also point out that private firms have insurance, trained personnel whose full-time job is contract spraying, and flexibility in schedule.

And the use of chemicals in general is apt to increase, whether applied privately or publicly. According to Dr. F. L. Timmons of the U. S. Department of Agriculture, 35 highway departments used chemical weed control in 1956. (Dr. Timmons' figures appeared in the May, 1958, issue of *The American Road Builder.*) This is considerably lower than the 44 states which reported chemical programs in 1962.

Duration of spraying season varies according to climate, type of control desired, and extent of spraying program. Applicators can analyze their own areas to determine when to go after this highway business, and decide how to fit these added contracts into their overall operation.

Jobs are let both on a statewide

(Continued on page W-28)

Figure II

Analysis of Representative States Which Presently Do Not Use Contract Applicators to Spray Weeds, Turf, etc., Along Roadsides

State	Miles Treated Annually	Number of Treatments Yearly	State's Yearly Expenditure for Weed Control Chemicals	Average Cost Per Mile Including Labor	Months Work Is Performed
Arkansas	500	one	$50,000.00	$200.00	March-June
Connecticut	3450	variable	45,000.00	25.00	variable
Florida	spot spraying only	na*	—50,000 lbs.	na*	na*
Maine	2500	one	na*	20.00	April-September
Maryland	250	two	6,000.00	3.75/acre	April-September
Nebraska	1000	one-four	4891.36	30.00	May-October
Oregon	7500	three	150,000.00	33.00	na*
Texas	10,000	one	100,000.00	15.00	April-July
Utah	4941	one	43,964.00	22.42	April-October
Vermont	1000	one	9,000.00	20.00	June-September

These states and those in Figure I do not comprise all states with definite road spraying programs. States listed are ones which reported in sufficient detail to be of value to contract applicators. Only state which did not reply at all was Missouri. *na: not available.

Beware of the Hazards of Spray Mist Drift!

By FRANK L. WILSON
Entomologist, Florida State Board of Health, Jacksonville

DURING the last few years poisonings by pesticides have received widespread publicity. In many cases this has resulted in an unjustified fear of all pesticides. Many individuals become concerned when any spray is used in their neighborhood.

Good public relations are necessary for every business, but are even more important in the horticultural spray industry. The neighbors and friends of our present customers form a pool from which we hope to draw new business. Yet an occasional sprayman may tend to irritate these prospective clients by allowing spray mist to drift onto their property. The resulting fear and ill will are the most common problems created by spray drift.

The dangers of these mists can be divided into the actual and imagined. We are all aware that actual dangers depend on the toxicity of the pesticide being used and the amount to which an individual is exposed. If highly toxic pesticides, such as parathion, are being used, the dangers from spray drift can be quite real.

This safety-conscious, masked serviceman is spraying with a homemade gun constructed from galvanized pipe. Note the pressure gauge that is being used for calibration, a necessity when regulating pressure to avoid drift hazard.

Frequently, the majority of complaints with which a sprayman must cope are imagined dangers. Many of us tend to disregard these "nuts," but to the person involved, the dangers are quite real. Occasionally an individual may go to great lengths to try to prove that he was harmed in some way. In Miami, for example, a neighbor's maid claimed she was poisoned by spray mist that had traveled over a masonry wall and through a louvered window. Over a year later she brought suit against the spray company concerned and was awarded damages by the court. Her case was based on the fact that even though she was not physically harmed, her fear of the pesticide had caused permanent psychological damage.

The relatively new field of herbicide application presents a major spray drift problem. Some herbicides, such as 2,4-D and 2,4,5-T, are capable of killing certain plants in extremely small dosages. In agricultural areas, cotton, tomatoes and peppers have proven very sensitive to these materials. Floridians use hibiscus, althea, and mallows, which are closely related plants, as ornamentals. These and many other plants can be damaged or even killed by spray drift of some herbicides. Replacement of full-grown ornamental plants can be expensive.

Origin of Spray Drift

Since spray drift can create unnecessary problems, it is to our advantage to prevent it. Drift consists of small spray particles or mist that is being carried by the wind. This mist is formed in one of three ways: at or shortly after leaving the nozzle (threads and filaments), in the air (shatter), or on impact.

When a liquid is forced through a simple nozzle or hole, it emerges as a solid stream. Air resistance causes constrictions and bulges, which are eventually pinched off as droplets. As the stream is broken up into drops, the last thin connecting filaments break up into small particles. The higher the droplet velocity, the greater the

WEEDS!

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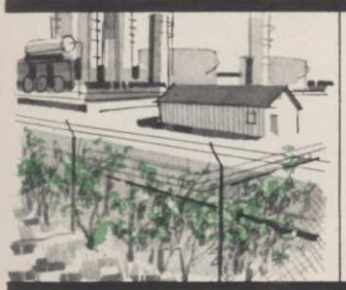
There's money in weeds, if you're on the right side of them. And that's with any of the many Du Pont weed and brush killers. They make custom weed control jobs easy and effective. ■ Check the typical problems below; chances are you'll see at least half of them within a mile of where you're standing. ■ The answers are easy, too, because Du Pont has a product to meet almost any weed control situation you'll encounter.

THE PROBLEM:
Hard-to-kill perennials —Johnson grass, Bermuda grass, nutgrass and quackgrass.

THE ANSWER:
Efficient, long-term control of grasses and weeds with HYVAR® isocil weed killer, an entirely new organic herbicide.

THE PROBLEM:
Rampant weed growth in storage areas causing fire hazards as well as wood and metal deterioration.

THE ANSWER:
A single application of KARMEX® diuron or TELVAR® monuron weed killers provides effective, low-cost control of weeds and grasses for a whole season.



THE PROBLEM:
Deep-rooted perennial weeds—morning glory, leafy spurge, Canada thistle and others.

THE ANSWER:
Easier control of noxious weeds than ever before with TRYSBEN® 200 weed killer. Also controls some woody plants.

THE PROBLEM:
Undesirable growth of brush on plant sites, roadsides, drainage ditches, rights-of-ways.

THE ANSWER:
Economical control of brush with safe, non-volatile, AMMATE® X or with DYBAR® fenuron weed and brush killer.

Only a few examples of the type of situations that mean opportunity for you are shown above. Product descriptions are necessarily brief, too—each of these Du Pont herbicides effectively control many other kinds of weeds or brush. For complete information mail the coupon to Du Pont today.

On all chemicals follow label instructions and warnings carefully.

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Room N-2539, Wilmington 98, Delaware

Please send me more information on Du Pont weed and brush killers.

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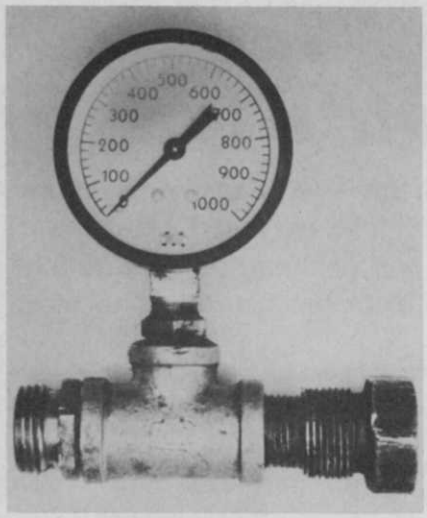
COMPANY _____

ADDRESS _____

CITY _____ STATE _____



Pressure gauges can be inserted between the operator's spray gun and hose. This method is not as accurate in determinating nozzle pressures as other means discussed in this article, but frequently this device is more convenient.

length of these filaments with a resulting increase in mist formation.

If the liquid is made to rotate before passing through the nozzle orifice, it will form a hollow cone. This cone emerges from the nozzle as a solid sheet; but due to centrifugal force and air resistance, it breaks up into slender threads which finally shatter to form droplets.

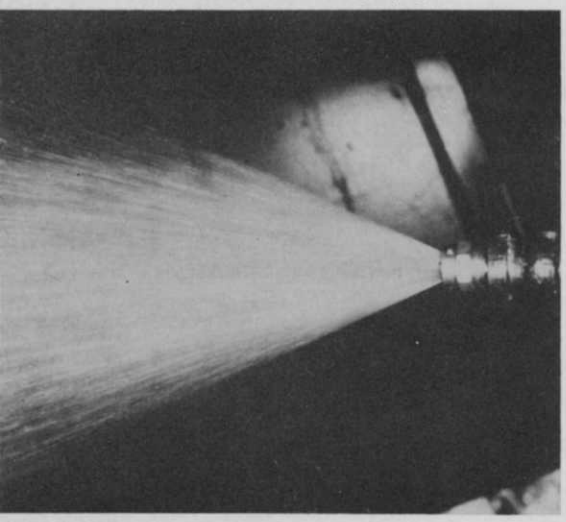
The shattering of spray droplets in the air is caused by "bagging" or "ballooning." When a high-velocity droplet encounters air resistance, it is flattened into a lens shape. As air pressure continues to act upon the droplet, the center is blown out into a balloon or hollow bag that is attached to a roughly circular rim. Continued air pressure causes the bag to burst into many small aerosol-sized particles. The rim of the particle also shatters, but the droplets are much larger than those formed from the bag. The rim contains approximately 70% of the spray droplet.

If the secondary droplets are traveling in excess of their critical velocity, they in turn will shatter due to this bagging phenomenon.

Brown[1] states that as much as 25% of a spray may be lost as mist. Lane[2] found that as much as 30% of a spray was reduced to aerosol or fog-sized particles in the shattering process that occurs when high-velocity droplets meet air resistance. This figure does not include the mist formed at the nozzle or on impact.

When a droplet encounters a solid surface, it shatters. The degree of shatter is proportionate to the velocity of the droplet at the time of impact. High-velocity droplets shatter into many very small droplets.

Flooding type nozzles like this produce a coarse, driving spray in a flat fan pattern, which is ideal for lawn spraying.

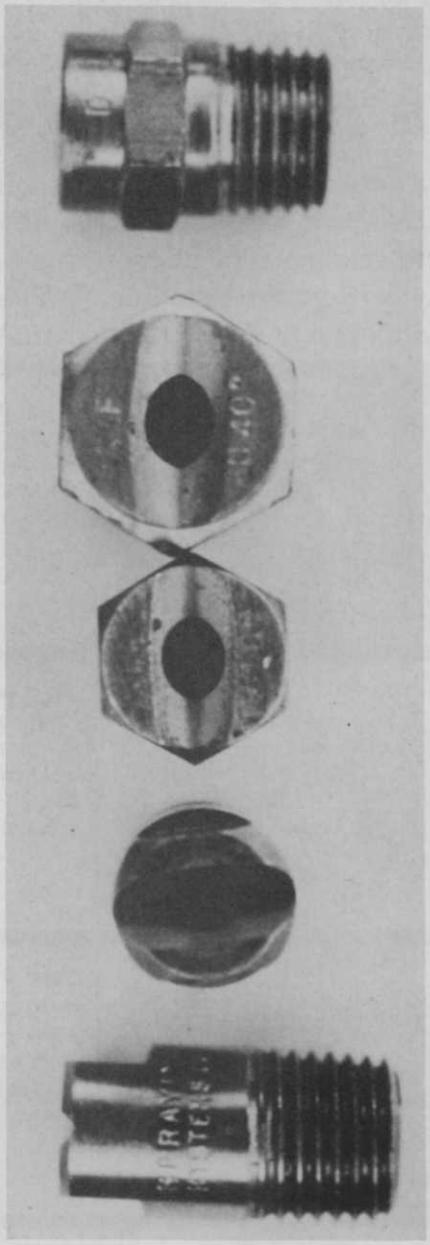


Use Low Velocity Sprays

The higher the pressure that is used to force a spray through the nozzle orifice, the greater the velocity of the resulting spray droplets. The higher the velocity of a droplet, the greater the tendency to form mist by each of the above methods. Therefore, to prevent mist formation, we should use low velocity (low pressure) sprays.

The common spray gun is designed around a hollow cone or disc-type nozzle. In this type nozzle a swirlplate is used to cause the characteristic hollow cone spray pattern. This plate has several spirally arranged holes that cause the liquid to whirl around in an eddy chamber before passing through the nozzle orifice.

The adjustable spray gun has a provision for bypassing the swirlplate, so that a solid stream spray pattern is formed. When this type gun is adjusted for a hollow cone spray pattern, the centrifugal force created by the swirlplate causes the liquid to leave the nozzle as a rotating hollow cone, which first appears as a sheet, then threads, and finally many very small particles. This characteristic and the resulting mist make this type nozzle unsuitable for applying highly toxic pesticides in residential areas.



These nozzles, of the flooding type, are well suited to the safe sprayman's needs. Spraying System's Vee-Jets (bottom), and Delavan's WF Series (top), are recommended by author Wilson.

During the early days of lawn spraying in Florida, all jobs were custom work. As the industry grew and competition increased, there has been a conversion to mass production techniques. With this change the time required on a spray job became more important, and spraymen began to work to increase the gallons per minute these spray machines can apply. The first attempts at overcoming this problem involved increased pressure. It was soon discovered, however, that tremendous pressures were required to push high

1. A. W. A. Brown, *Insect Control by Chemicals*, John Wiley and Sons, Inc., New York City, 1951.
2. W. R. Lane, "Shatter of Drops in Streams of Air," *Industrial and Engineering Chemistry*, Vol. 43, 1951, pp. 1312 through 1317.

Customer satisfaction—permanent patronage—requires sure, consistent results: the kind you can guarantee when you use TRITHION insecticide for lawn chinch bug control.

Chinch bugs are small sucking insects that feed on the juice in leaves and stems of grass, causing brown patches and eventual death of infested lawns. Chinch bug destruction is a growing problem around the country . . . but one you can solve with TRITHION.

Since 1960, thousands of lawns have been treated with TRITHION. Results have been outstanding!

TRITHION *gives quick, positive control.* It's a fast-acting compound that controls *all* chinch bugs, even those resistant to other materials.

TRITHION *is easy to handle safely.* It is less hazardous to handle than many other organic phosphate pesticides. TRITHION is an easy-to-apply emulsifiable liquid . . . and also is available in granular form.

TRITHION *offers one-shot control . . . that lasts.* Repeat applications are rarely needed with TRITHION—"one-shot control" *stops* chinch bugs. Its long residual action means long-term protection . . . with resulting reduced costs.

Use TRITHION on *your* customers' lawns. You'll boost and *maintain* the demand for *your* service. For details, write Stauffer Chemical Company, Agricultural Chemicals Division, 380 Madison Ave., New York 17, N. Y. ©Stauffer's Reg. T.M. for an insecticide-acaricide

Stauffer
CHEMICALS

gallonage through the relatively small orifice of the largest disc. Therefore, it became necessary to find a new type nozzle.

Vee-Jet and Delavan Nozzles Used

Spraying Systems Vee-Jets and Delavan WF Series nozzles were "discovered" as a result of this search. Both of these series had originally been designed for industrial application and to act as high-volume, flooding-type nozzles. These nozzles have an oblong orifice located in a milled slot on the surface of the nozzle face. They are available in various sizes, from those that handle a fraction of a gallon per minute, up to those that deliver 40 gallons per minute at 40 pounds pressure. They deliver a coarse, driving spray in a flat fan pattern that is ideal for lawn spraying.

Both manufacturers make their nozzles with standard pipe thread, which simplifies the construction of your own spray gun from galvanized pipe.

The choice of pressure is equally as important as the choice of nozzles in the prevention of mist formation. Vee-Jets and Delavan's WF's produce a minimum of mist when operated at 80 psi or less *at the nozzle*. This can be checked by a pressure gauge mounted on a pipe "T." This "T" is inserted between the nozzle and the gun.

Both manufacturers publish performance tables for their respective nozzles. These tables show the gallons per minute delivered by each size nozzle at various pressures. Therefore, if we know the nozzle size and the nozzle operating pressure, we can determine the gallons delivered per minute by consulting the tables. This method can be used as a quick way of calibrating your spray machine.

In summary, control of spray drift or mist is important in maintaining good public relations. The choice of nozzle and the pressure at which this nozzle is operated are the two major factors in preventing mist formation.

Editor's note: More information about the nozzles discussed here may be obtained from Spraying Systems Co., 3201 Randolph St., Bellwood, Ill., or Delavan Mfg. Co., Grand Ave. and Fourth St., West Des Moines, Iowa. Both manufacturers supply specification charts covering the equipment discussed in Mr. Wilson's article.

Handy USDA Guide to Respirato

WITH all the recent attention to pesticides and the concern over their safe use, contract applicators will be particularly interested in safety information contained in a recent bulletin from the U. S. Department of Agriculture. This new brochure, called "Respiratory Devices for Protection against Certain Pesticides" (ARS-33-76), has valuable pointers for spraymen, and includes the chart reproduced on the next page.

Scientists from USDA's Entomology Research Service, who compiled the data, hasten to point out that respirators do *not* provide needed protection from inhalation of pesticide dusts, mists, and vapors for operators formulating or mixing pesticides in closed or inadequately ventilated spaces. "Full-face gas masks equipped with tested canisters are worn under these conditions," the bulletin states. In addition, if servicemen are working in closed spaces, proper protective clothing, as specified on pesticide labels, must be worn.

Use of respiratory protective devices does not eliminate the need for other precautions in handling toxic chemicals. Rubber gloves and clean clothing are a must, and adequate hygienic practices are necessary.

When a serviceman shows any signs of dizziness or nausea, he should be removed from the treatment area immediately and placed in the care of a physician. Management should supply company doctors with all available information about pesticides used from day-to-day, so that illness resulting from accidents can be properly diagnosed.

FOOTNOTES TO CHART AT RIGHT

Respirators With Face-Mounted Cartridges

A. Respirator No. 5055, equipped with R-55 filter and cartridge unit. Two units attached to facepiece. (American Optical Co., Safety Division)

B. Healthguard Respirator style 95, equipped with Code B cartridge and filter 1000 or 1001. One unit attached to facepiece. (Chicago Eye Shield Co.)

C. DCA 6100 Respirator, with Para-A cartridge and DC 6100-7 felt filter. (Pulmosan Safety Equipment Corp.)

D. Agrisol Dust and Vapor Respirator, equipped with R-414 filter and 11-A cartridge. Two units attached to facepiece. (Ray-O-Vac Co., Willson Products Division)

E. Respirator No. 5561, equipped with filter cartridge combination R-561. (American Optical Co., Safety Division)

F. Farm Spray Respirator No. CR-72183, equipped with cartridge No. CR-49293 and filter No. 73488. (Mine Safety Appliances Co.)

G. All Vision Chemical Cartridge Respirator No. CR-74910, equipped with inner cartridge No. CR-73841 and outer cartridge No. 73927. (Mine Safety Appliances Co.)

H. Agritox Respirator, equipped with cartridge No. 11A (new type) and filter No. R490. (Ray-O-Vac Co., Willson Products Division)

I. Respirator No. 5058, with filter-cartridge combination R-58. (American Optical Co., Safety Division)

J. C-241 Respirator, with CMP cartridge and C-241-7 filter. (Pulmosan Safety Equipment Corp.)

K. Gasfoe Respirator No. CM-86007, equipped with cartridge No. CM-76883 and mineral-wool filter No. CM-79786. (Mine Safety Appliances Co.)

Supplied-Air Respirators

a. Whitecap Model SU-1 with No. 901 rubberized shroud, No. 301 cartridge, and No. 101 filter element. (Jamieson Laboratories, Inc.)

b. Same as L, except with extra fine No. 102 filter element. (Jamieson Laboratories, Inc.)

Gas-Mask Canisters

1. Chin Style (282-OVAG-F) Insecticide Canister. (Acme Protection Equipment Co.)
2. Canister GMC-1. (Mine Safety Appliances Co.)
3. Canister G3FD. (Ray-O-Vac Co., Willson Products Division)
4. Universal-type canister of any manufacturer. Type N, bearing Bureau of Mines approval.
5. Military Canister No. 084-Military. (Acme Protection Equipment Co.)
6. Canister No. H-3, equipped with facepiece filter holder and throwaway filter No. R361 or R393. Can be obtained with either a full-face gas mask or a half-mask facepiece. The half-mask facepiece should not be used when mixing or handling insecticides in enclosed spaces or applying aerosols in greenhouses, but is suitable for field use. (Ray-O-Vac Co., Willson Products Division)
7. Canister No. 3235 Type C-40. (Davis Emergency Equipment Co.)

The addresses of the companies supplying these respirators and gas masks are given below. Respirators are also available from pesticides distributors and mail-order houses.

Acme Protection Equipment Co.,
1201 Kalamazoo St., South Haven, Mich.

American Optical Co.,
Safety Division, Southbridge, Mass.

Chicago Eye Shield Co.,
2300 Warren Blvd., Chicago, Ill.

Davis Emergency Equipment Co.,
45-57 Halleck St., Newark 4, N.J.

Jamieson Laboratories, Inc.,
7900 Haskell Ave., Van Nuys, Calif.

Mine Safety Appliances Co.,
201 North Braddock Ave., Pittsburgh 8, Pa.

Pulmosan Safety Equipment Corp.,
644 Pacific St., Brooklyn 17, N.Y.

Ray-O-Vac Co.,
Willson Products Division, Reading, Pa.

hows Spraymen Which Mask to Use on the Job

Commercially available respirators and gas-mask cannisters that have been tested by the USDA and found to give adequate protection against dusts, mists, and low vapor concentrations of certain pesticides are listed below. Save this and refer to it whenever using a chemical included here.

Pesticides and pesticide mixtures	Respirators with face-mounted cartridges											Supplied-air respirators		Gas-mask canisters						
	A	B	C	D	E	F	G	H	I	J	K	a	b	1	2	3	4	5	6	7
aldrin	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
calcium copper chloride					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
carbophenothion (S-[(p-chlorophenylthio)methyl] O, O-diethyl phosphorodithioate); Trithion.					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ceresan M (N-(ethylmercuri)-p-toluenesulfonanilide)					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
chlordane	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DD-Mixture (dichloropropane-dichloropropene mixture)					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DDVP					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Delnav (a mixture of 2, 3-p-dioxanedithiol S, S-bis(O, O-diethyl phosphorodithioate)(70%) and related compounds).					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
demeton					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
diazinon (O, O-diethyl O-(2-isopropyl-4-methyl-6-pyrimidinyl) phosphorothioate).					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
dicapthon					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
dieldrin	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
dimethoate					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Di-syston (O, O-diethyl S-[2-(ethylthio)ethyl] phosphorodithioate)					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
endosulfan (6, 7, 8, 9, 10, 10-hexachloro-1, 5, 5a, 6, 9, 9a-hexahydro-6, 9-methano-2, 4, 3-benzodioxathiepin-3-oxide); Thiodan.					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
endrin	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
EPN	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ethion					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ethylene dibromide					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ferbam					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
malathion	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
methyl parathion	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Methyl Trithion (O, O-dimethyl S-p-chlorophenylthiomethyl phosphorodithioate).					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
naled (emulsion) (1, 2-dibromo-2, 2-dichloroethyl dimethyl phosphate); Dibrom.					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
naled (xylene solution); Dibrom									+	+	+	+	+	+			+	+	+	+
nicotine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Panogen (cyano(methylmercuri)guanidine)					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
parathion	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
phorate					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Phosdrin (a mixture of the alpha isomer of 2-carbomethoxy-1-methylvinyl dimethyl phosphate (not less than 60%) and related compounds (not more than 40%).									+	+			+	+			+	+	+	
Phostex (a mixture of bis(dialkyloxyphosphinothioyl) disulfides (alkyl ratio 75% ethyl, 25% isopropyl).					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ronnel					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
schradan					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sevin (1-naphthyl N-methylcarbamate)					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Shell SD-3562 (2-dimethylcarbamoyl-1-methylvinyl dimethyl phosphate).					+			+	+	+										
TEPP					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Terrachlor (pentachloronitrobenzene)					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Vapam (sodium N-methyldithiocarbamate)					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
zineb					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Zinophos (O, O-diethyl O-2-pyrazinyl phosphorothioate)						+	+	+	+	+		+	+	+	+	+	+	+	+	+
carbophenothion + methyl parathion + DDT						+				+	+									
DDVP + malathion									+	+				+	+	+	+	+	+	+
DDVP + ronnel									+	+				+	+	+	+	+	+	+
methyl parathion + endrin								+	+	+	+			+			+	+	+	
Methyl Trithion + DDT					+	+	+	+	+	+	+			+	+	+	+	+	+	+
toxaphene, DDT, methyl parathion + ethion					+	+	+	+	+	+	+			+	+	+	+	+	+	+

1/ Letters and numbers refer to those given in the preceding lists. Plus sign (+) indicates acceptability.

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New Herbicide, Dacamine, Combines Safety of Amines, Punch of Esters

By DRS. R. J. MARRESE and B. A. SPRAYBERRY

Agronomist and Biochemist respectively, Technical Service Department,

Diamond Alkali Company, Cleveland, Ohio

PHENOXY herbicides, such as 2,4-D and 2,4,5-T, have been the backbone of most weed control programs involving the suppression of broadleaf weeds in both crop and noncropland areas for almost 20 years.

Most of these formulations consist of either the water-soluble amine salts of the water-emulsifiable esters of 2,4-D and 2,4,5-T. The inherent nonvolatile safety feature of the water-soluble amines is a well-known fact.

It has also become well established that at equal rates of application, the effectiveness and consistency of kill is greater with the water-emulsifiable esters. Thus, both materials, each with its particular advantage, have found their place as essential tools in spray programs.

In recent years, however, there has been a trend towards more mixed cropping in many areas of the United States. There has also been an increase in our highway and utility right-of-way areas and the spraying of these areas for broadleaf weed and brush control. An increase in suburban living, recreational facilities, and the move of industry outside of cities has also increased the spraying of turf areas.

All this has combined to bring areas of susceptible, desirable broadleaf plants in closer contact to the areas where 2,4-D and 2,4,5-T spray programs are being followed.

Many people, therefore, are claiming greater damage by the volatility from esters, both the regular-volatile and the low-volatile ones as well. In fact, litigation has often been instigated against the applicator in cases in which the grower merely suspected that these esters were being used near his crops. As a result, some states have passed legislation prohibiting the use of 2,4-D and 2,4,5-T esters, allowing only the use of the less effective and more erratic water-soluble amine salts.

In view of the above facts, it can be seen that the "ideal" phenoxy herbicide would combine both the efficacy features of the esters and nonvolatility features of the amines. Diamond's new Dacamine is such a product. The Dacamines are manufactured by reacting 2,4-D and/or 2,4,5-T acid with a long chain fatty amine. This oil-soluble material is then formulated to produce a water-emulsifiable amine salt of 2,4-D, 2,4,5-T or mixtures of D and T.

Characteristics of Dacamines—

—Physical

The Dacamines are brown viscous liquids. Under extremely cold conditions, they become stiff and pour with difficulty. There is no precipitation, however, or separation of the toxicant from other components of the formulation (as there is with the water-soluble amines). Therefore, heating to the point where the Dacamines will flow once more is all that is needed for proper use of this material after a long period of cold weather. Normal temperature changes between the winter and spring seasons will usually bring about this reduction in viscosity. This physical characteristic should not be taken as being exceptionally unusual since other formulations react in a similar fashion during periods of extreme cold.

The bloom (white, fluffy characteristics of emulsions when concentrate enters water) associated with the Dacamines should also be noted. Dacamines do not produce the immediate bloom associated with ester formulations. But it is common knowledge that the degree of immediate bloom is in no way correlated with the killing power of any emulsifiable concentrate. With slight agitation the Dacamines will produce a very sound and stable emulsion.

Present Dacamine formulations, being oil-soluble and water-emulsifiable, may be used in the same fashion as the esters, insofar as spray tanks, pumps, nozzles, strainers, pressure, water, etc., are concerned.

Dacamines, being oil-soluble, have been incorporated into formulations in which 90:10 water: oil mixtures may be used in any given final spray mixture. In brush control work, this means that the Dacamines can be used later in the growing season than the water-soluble amines. The possibility of adding oil to spray mixes to be used late in the season is very important in brush-control work and shows another advantage of the Dacamines. Formulations for use in a straight oil carrier are also available.

—Chemical

Technical Dacamines do not possess the characteristic odor associated with water-soluble amines. Any odors from the various formulations of this particular product would be ones emanating from the solvents used in the formulation. Under certain conditions, this lack of "fish-like" odor is another advantage of the Dacamines over the water-soluble amines.

Volatility comparisons made at Boyce-Thompson Institute of Plant Research, using the proce-

Spraymen have long sought a phenoxy herbicide which, while fast-acting and effective, is still relatively safe to desirable plants near treatment area. Dacamine may be the answer, this article contends.

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dure officially approved by the Association of Official Agricultural Chemists, show the Dacamine salts of 2,4-D and 2,4,5-T are in a class safer than the standard low-volatile esters being used commercially today. To detect smaller volatility differences, the plants were held for an additional 7 days, after which leaf modification readings were recorded.

Diamond's oil-soluble, water-emulsifiable amine salts of 2,4-D and 2,4,5-T showed no leaf modifications, while some of the low volatile 2,4-D formulations showed a degree of leaf modification, indicating some minor volatility during this 7-day period.

—Physiologic Action

Plant morphological responses to the Dacamines, as one might expect, are quite similar to those exhibited from applications of other phenoxy acid formulations. The characteristic twisting and leaf malformations become evident. This is then followed by a chlorotic condition which in turn is followed by death and browning of the plant.

In many instances, the apparent rate of physiologic action with the Dacamines is considerably slower than that obtained with other phenoxy acid formulations. This appears to be a definite advantage in the control of deep-rooted and creeping perennial weeds such as field bindweed, Canada thistle, leafy spurge, and Russian knapweed. The important consideration in the control of these deep-rooted perennial species is the completeness of kill and lack of regrowth. Oftentimes a rapid top kill does not allow an adequate amount of the weedkiller to be translocated to the extensive storage and reproductive organs of these plants. In many instances, therefore, a slower kill may eventually achieve more satisfactory results than those obtained with rapid browning and top kill.

The Dacamines, of course, contain the normal limitations that one would expect with a phenoxy herbicide. That is, they will not control perennial grasses such as Johnsongrass and quackgrass. Then, too, control with these materials is not as good when applied to mature plants. As in the case with all hormonal herbicides, greater effect is obtained when application is made to young, vigorously growing plants.

Some Results with the Dacamines —Dacamine-D

In the northwest, comparative tests were conducted on the small grains such as wheat and barley. Dacamine, at rates ranging from ½ to 2 pounds of active ingredient per acre, was doing a better job against bindweed, Russian knapweed, and Canada thistle than the water-soluble amines, the butyl esters, and the low volatile esters applied at equivalent rates.

This material has also looked good in corn trials against witchweed in North Carolina. An Ohio farmer felt that the Dacamines gave better control in a comparative test with the iso-propyl formulations. The material was applied pre-emerge and the Dacamine appeared to also do a better job against the annual grasses. This same phenomenon has also been noted in other tests. Dacamine at ¼ pound active ingredient per acre has also been equal to or better than the esters in the control of water plantain in Arkansas rice trials. The 2 pound Dacamine rate is also giving exceptional control of alligator weed in Florida and Louisiana drainage ditches and waterways.

—Dacamine-T

A southern railroad tested Dacamine on a right-of-way adjoining cotton. They purposely used a high rate of 8 to 14 pounds of active ingredient per acre to check volatility. There was no report of cotton damage in any of their tests. In other tests, Dacamine has been as effective as ester formulations against such species as sumac, sassafras, locust, oak, maple, sweet gum, cherry, and hickory. It has also looked more effective than the esters against the conifers.

A herbicide that combines the safety of amines with the punch of esters has long been sought by the weed and brush control industry. With the current demand for greater herbicide safety, this need has become increasingly critical. It appears that Diamond's Dacamine may well fit this need.

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"Scientific Guide to Pest Control Operations" (published by Pest Control magazine) was written by and for pest controllers. Author Dr. Lee C. Truman is a successful PCO in Indianapolis, Ind., and Professor William L. Butts is in charge of the four-year pest control curriculum of Purdue's entomology department. Working with them was an editorial committee representing important phases of the pest control industry: Dr. John V. Osmun, head of Purdue's entomology department; Dr. Howard O. Deay, Purdue professor of entomology; Dr. Philip J. Spear, technical director of the National Pest Control Association; Dr. Harry D. Pratt, in charge of insect and rodent control training for the Communicable Disease Center of the U.S. Public Health Service; George L. Hockenyos, PCO-researcher, owner of Sentinel Laboratories, Springfield, Ill.; and James A. Nelson, editor and publisher of Pest Control magazine.

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Executive committeemen for the 17th annual Northeastern Weed Control Conference are (front row, l-r) Secretary-Treasurer J. A. Meade, Agronomy Department, University of Maryland; President D. A. Schallock, Extension Weed Control Specialist, Rutgers University; Vice President A. J. Tafuro, American Cyanamid Co.; Public Relations Chairman C. R. Skogley, Agronomy Department, University of Rhode Island; (back row, l-r) Research Coordinator G. D. Hill, Jr., DuPont Experimental Station; Sustaining Membership Chairman F. A. Ashbaugh, West Penn Power Co.; Awards Chairman Lawrence Southwick, Research and Development, Dow Chemical Co.; and Program Chairman Richard D. Ilnicki, Department of Farm Crops, Rutgers University.

Northeast Weedmen Meet Jan. 9-11 For 17th Annual NEWC Conference

Promising new chemicals and other developments in the weed control industry are being examined closely by more than 700 state, federal, and industry workers from 15 northeastern states at the 17th annual Northeastern Weed Control Conference.

D. A. Schallock, extension weed control specialist at Rutgers University, New Brunswick, N.J., conference president, is opening the three-day conference Wednesday morning, January 9th, at the Hotel New Yorker, New York City.

First paper of the more than 125 to be delivered is by A. T. Hanson, Head-Overhead Lines Section, Boston Edison Co., Boston, Mass., on what his firm expects in chemical brush control.

Other programs of special interest to contract applicators on Wednesday are new chemicals for weed control, by Dr. R. D. Ilnicki, N.J. Agricultural Experiment Station, New Brunswick, and a panel on new herbicides, chaired by A. Zaharchuk, G. L. F. Soil Building Service, Ithaca, N.Y.

Thursday afternoon, during the sessions on agronomic crops, Drs. R. A. Peters and P. E. Keeley, from the University of Connecticut, Storrs, are covering the use of Atrazine for crabgrass control.

Thursday morning's session on industrial chemicals includes a report on tractor-mounted mist blowers and an analysis of 10 years of chemical brush control. Chairman of the session is B. W. Bergstrom, New England Power Service Co., Boston, Mass.

In the afternoon, Paul M. Ritty and M. G. Wiltse, from The Dow Chemical Co., Midland, Mich., are reviewing grass control on railway roadbeds.

A thorough study of aquatics is tentatively scheduled for Thursday morning. J. E. Gallagher, of Amchem Products, Inc., Ambler, Pa., is program chairman.

Five studies of weed control in turfgrass, under the chairmanship of J. F. Cornman, Cornell University, Ithaca, N.Y., are set for Thursday or Friday morning.

A. M. S. Pridham, also from Cornell University, reports on experiments with Casoron, for weed control in ornamentals, Friday morning, in the session on horticultural crops. Later in the morning Pridham discusses the residual effect of herbicides on growth of ornamentals.

Discuss Soil Fumigant

Following Pridham's second paper, Trizone, reported to be a new broad spectrum soil fumigant, is being reviewed by The Dow Chemical Co.'s R. P. Harrison.

Friday morning's session on agronomic crops contains two features of special interest to CAs: use of herbicides in the establishment of Bermudagrass, by R. W. Duell and R. D. Ilnicki, from the N.J. Agricultural Experiment Station; and chemical control of Bermudagrass, also by Duell and Ilnicki.

Andrew M. Ditton, from the N.Y. State Department of Public Roads, heads the final session of the 3-day conference, on highways.

MH-30 Examined

First report in this group, scheduled for 8:30 Friday morning in the Washington Room of the Hotel New Yorker, covers trials to determine the practical application of MH-30 in a roadside maintenance program. E. W. Muller, landscaper for the N.Y. State Department of Public Works, in Hormel, leads discussion of this subject.

MH-30 will also be covered later in the morning, when U.S. Rubber's Paul W. Bohne investigates how rates, time, and concentration affect the ability of MH-30 to retard grass growth.

Two other reports being given Friday morning are oil-soluble amines for roadside brush control, by Richard J. Marrese, from Diamond Alkali Co. in Cleveland, Ohio, and a review of herbicide work on Pennsylvania state highways.

In all, more than 125 papers, covering horticultural and agronomic crops, aquatics, and turf, are being delivered at the 3-day convention.

Shell Has Dieldrin Brochure

A new 12-page, 4-color brochure on dieldrin has been released by Shell Chemical Co.

Titled "How to Control Lawn Insects," the pamphlet is divided into three sections: soil insects, foliage insects, and the forms and uses of dieldrin. Included are dosage specifications, plus illustrations and descriptions of each of the common lawn insects and the damage they do.

CAs may obtain a free copy of the brochure by writing to Agricultural Chemicals Division, Shell Chemical Co., 50 West 50th St., New York 20, N.Y.

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34th International Turf-Grass Meet Set for Feb. 11-15 in San Diego, Calif.

World's largest turfgrass management conference and exhibition show will be held at the El Cortez Hotel in San Diego, California, February 11-15.

Sponsored by the Golf Course Superintendents Association of America, the convention is expected to draw more than 2500 delegates from all parts of the United States and many foreign countries.

"In addition to sessions on maintenance, public relations and advanced turfgrass technology will receive detailed examinations," Roy W. Nelson, association vice president and program chairman for the conference, reveals.

During the session on advanced technology, soil fertilization, plant response, slo-release fertilizers, and salinity problems will be highlighted.

Planning off-season operations will begin the program on maintenance problems in the northern and eastern sections of the country. Ice sheet damage will also be investigated, and the results of specified research into this area will be discussed. Rounding out this feature of the convention will be an investigation of the consequences and prospects of irrigation and automation in the East.

Delegates from the South and West expect to spend most of their program on specific turf problems, although irrigation and automation will also be covered. One highlight of the southern and western program will be an investigation of turf maintenance problems in Hawaii.

Public relations for servicemen and salesmen, as well as managers, will be stressed at the meet. Instructions in the most effective use of the subtle and sensitive factors of public relations will be featured, as well as examples of some of the more common errors made in this field.

Leisure-time activities for delegates include a Western steak-fry, receptions, and the GCSAA's annual pre-convention golf tournament (Feb. 6-8), to be held at Bermuda Dunes, Eldorado, Indian Wells, La Quinta, Tamarick, and Thunderbird Country Clubs.

A full ladies program has also been arranged, including tours of the San Diego Zoological Gardens and surrounding countryside, and a boat ride around the harbor, the conference committee reports.

For advance registration forms, and additional information about the conference, write the Golf Course Superintendents Association of America, P.O. Box 1385, Jacksonville, Fla.

ASP-51, Stauffer's New Chinch Bug Killer, Available in Spring

A new insecticide, claimed to be especially effective for lawn chinch bug control, will be released by Stauffer Chemical Co. this spring.

Called ASP-51, the insecticide has a high initial kill of 95% or better in 48 hours, with control lasting 60-90 days, the firm reports. Even chinch bugs resistant to other insecticides are controlled with ASP-51, according to Stauffer.

When diluted with water for lawn spray, ASP-51 is said not to have any harmful effect on any turfgrass, and is only slightly toxic to animals. ASP-51, technically tetra-n-propyldithionopyrophosphate, is now on the recommended list for Florida, where it has been tested for more than two years, the company reports.

For more information on ASP-51, write Stauffer Chemical Co., 380 Madison Ave., New York 17, N.Y.

Sterilize Soil from Air

Recent tests in Southern California indicate that soil sterilants may be successfully applied by helicopter in areas inaccessible to ground equipment.

Because of the fire hazard of weeds and brush alongside railroad tracks, the U.S. Forest Service in California requires that such fuel be removed in an area extending 200 feet out from the track.

In the past, train crews removed the brush by controlled burning in the early summer. Experiments

To reduce fire hazards along this California railroad, helicopters spray Ureabor 62, a soil sterilant from U. S. Borax.

along 8 miles of track in Cajon Pass in the San Bernardino Mountains indicate that this may no longer be necessary.

More than 150 acres of land were treated by a helicopter applying Ureabor 62, a soil sterilant from U.S. Borax, along the track. Flying time for the helicopter-herbicide application was approximately 8 hours.

Granulated weedkiller was applied to the soil from a specially designed spreader attached to saddle tanks on the helicopter. Officials from Santa Fe Railroad, Union Pacific Railroad, the U.S. Forest Service, San Bernardino County governmental agencies, and United States Borax & Chemical Corp. who viewed the tests, stated that the experiment seemed entirely successful.

Atrazine Bulletin from Geigy

Recommendations for eradicating several weed species in western states with Atrazine, including Russian thistle, puncture vine, and tarweed, are available in a new bulletin from Geigy Agricultural Chemicals.

Titled "Atrazine 80W Information Sheet No. 7," the bulletin also contains suggestions for using a mixture of Atrazine and Simazine for early post-emergence applications.

CAs may obtain a free copy of the bulletin by writing to the firm at P.O. Box 430, Yonkers, N.Y.

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15th Annual Calif. Weed Control Meet Set for Jan. 22-24; Has Short Course

Special feature of the 15th Annual California Weed Conference will be a short course led by W. A. Harvey, extension weed control specialist with the University of California, Wednesday morning, second day of the annual meeting.

The 3-day convention will be held at the Miramar Hotel, Santa Barbara, January 22-24.

John Smith, of the California Division of Highways in Los Angeles, will review weed control in ornamentals, and Bill Hopkins, Best Fertilizer Co., Woodland, reports on selective weed control in ornamental ground covers.

A progress report on grass suppression will be given by Jack P. Corkins, Naugatuck Chemical Co., Porterville. Dr. Victor Younger, from the University of California, will survey control of annual weeds in turf. Control of perennial weeds in turf will be examined by Wayne Morgan, farm advisor, Los Angeles.

Ray Gieberger, Santa Barbara farm advisor, chairs the first afternoon session of the short course.

A progress report on U. S. weed control programs will be given by Dr. Warren Shaw, Agricultural Research Service, U. S. Department of Agriculture, Beltsville, Md. Dr. Shaw is president of the Weed Society of America.

Sodium arsenite will receive a two-part study. John Hills, State Department of Agriculture, Sacramento, will review sodium arsenite regulations, while W. B. McHenry, University of California in Davis, will describe some of the more common and more practical substitutes for the compound.

Wednesday evening Charles Hansen, Alco Chemical Co., Artesia, heads the session on new products for weed control. CAs attending will get a glimpse of many of next year's chemicals, *Weeds and Turf* was told.

Two sessions of particular interest to CAs the last day of the conference, Jan. 24, are the discussion on aquatic weed problems by Don Seaman and Richard Yeo, both from the Botany Department of the University of California, and J. D. Hortingh's survey of utility right-of-way brush control. Hortingh is with the Pacific Gas & Electric Co., San Francisco.

Conference is open to all interested CAs. For more information write Vincent H. Schweers, P.O. Box 990, Visalia, Calif.

Horsfall Receives Merit Award

Dr. James G. Horsfall, director of the Conn. Agricultural Experiment Station, is the first recipient of an award in plant pathology created by the Northeastern Division of the American Phytopathological Society.

A contributor to the development of several new fungicides for control of plant diseases, and a pioneer in plant chemotherapy, Dr. Horsfall was honored for "exceptionally meritorious contributions in plant pathology" at the annual meeting of the society recently.

Meeting Dates

Northeastern Weed Control Conference, Hotel New Yorker, New York, N.Y., Jan. 9-11, 1963.

Southern Weed Control Conference, Admiral Semmes Hotel, Mobile, Ala., Jan. 16-18.

California Weed Control Conference, Santa Barbara, Jan. 22-24.

15th Annual Illinois Custom Spray Operators' Training School, University of Illinois, Urbana, Jan. 23-24.

34th Annual International Turf-Grass Conference and Show, El Cortez Hotel, San Diego, Calif., Feb. 11-15.

Aquatic Weed Control Society Annual Meeting, LaSalle Hotel, Chicago, Ill., Feb. 12-13.

Western Weed Control Conference, Sheraton Hotel, Portland, Ore., March 20-22.

2nd Annual Florida Turfgrass Association Trade Show, Hotel Seville, Miami Beach, Fla., May 2-4.

Southern Weedmen Plan Jan. 16-18 Meet; Focus on Bermudagrass and Crabgrass

"Disan is a promising new herbicide for use in turf weed control," Dr. C. L. Dewald of the Agricultural Research and Development Laboratories in Mountain View, Calif., relates. Dr. Dewald will report on several experiments with the new spray at the Southern Weed Conference, set for Jan. 16-18 at the Admiral Semmes Hotel in Mobile, Ala.

Cooperating with Dr. Dewald in the study and report are Dr. L. W. Fincher, of the Richmond (Calif.) Research and Development Laboratories, and Dr. B. H. Lake, who works with Dr. Dewald at Mountain View.

Areas of major importance to CAs will be focused on by conference speakers. W. M. Lewis and Glenn C. Klingman, both from the Department of Crop Science at North Carolina State College, will deliver a joint paper on three evaluation methods for taking weed control data in Bermudagrass turf.

Control of crabgrass and dallisgrass in narrow turf will be examined by Jack T. Thompson and W. S. Hardcastle of the Georgia Experiment Station.

Weed control in agronomic crops, including turf, is under the direction of R. J. Smith, of Rice Branch Experiment Station.

D. C. Francisco, from the Tennessee Valley Authority, heads the committee investigating weed control in utilities, railroads, highway rights-of-way, and in industrial sites.

Look into control of aquatic weeds and special weed problems will be directed by R. D. Blackburn, of the Plantation Field Department, USDA, in Fort Lauderdale, Fla.

More than 500 research and education workers, representing city, state, and federal agencies, as well as chemical companies and other interested persons from 12 southern states, are expected to attend the meeting.

Several sections of the conference will be of special interest to contract applicators.

Spray vs. Dust Uses Detailed

"To the many people who ask whether to use a dust or a spray, either wettable powder or emulsifiable concentrate, I explain that each has its own advantages, and that no one solution will answer all the situations a CA will be faced with," explains Dr. M. H. Farrier, entomologist at North Carolina State College.

Some insecticides are prepared only as a wettable powder and emulsion concentrate, while DDT, for example, will not dissolve in water when in a pure state. For DDT to be used in water, it must have an emulsifiable concentrate added, Dr. Farrier continues.

"Additives" May Harm Leaves

But an emulsifiable concentrate has much more in it than just an insecticide, Dr. Farrier cautions CAs, and many times these "additives," rather than the insecticides, are what cause injury to sensitive plant leaves. For this reason, wettable powders are usually safer to use on plants.

Since wettable powder is actually very small particles, even in the spray mixture, it tends to settle out, and a spray rig with a built-in agitator is usually necessary for effective use, Dr. Farrier notes. When used in a sprayer that does not have an agitator, the mixture should be "sloshed around" every minute or so, Dr. Farrier recommends.

Since emulsifiable concentrates usually do not settle out as rapidly as wettable powders, they are usually better when a sprayer without an agitator is used.

Sprays Are Best in High Winds

Sprays can be used more effectively than dusts in higher winds, Dr. Farrier believes, and also recommends their use on plants, since sprays seem to stick to the underside of leaves better.

Two advantages of dusts are that they come ready-mixed, and are lighter to handle than spray mixtures, Dr. Farrier points out. Inaccessible places such as swamps can be fairly effectively dusted by letting the wind carry the dust out over the swamp, while a sprayer could never be used, Dr. Farrier concludes.

—W & T Mailbox—

W&T Proves Invaluable Asset

It is difficult to express our sincere appreciation for all the help your magazine has given to the Horticultural Spraymen's Association of Florida.

The news articles and comments have been an invaluable asset in our endeavor to serve the public.

Thomas E. Hamall

Publicity Director
Horticultural Spraymen's Assn.
Miami, Fla.

Interested in *Weeds and Turf*

As Turf Extension Agronomist here in Pennsylvania, and working in close cooperation with Dr. J. M. Duich of the Resident and Research Staff, I am quite interested in your new publication *Weeds and Turf*. I especially appreciated the October issue, which contained the Chemical Suppliers Guide.

John C. Harper II

Extension Agronomist
Cooperative Extension Service
Pennsylvania State University
University Park, Pa.

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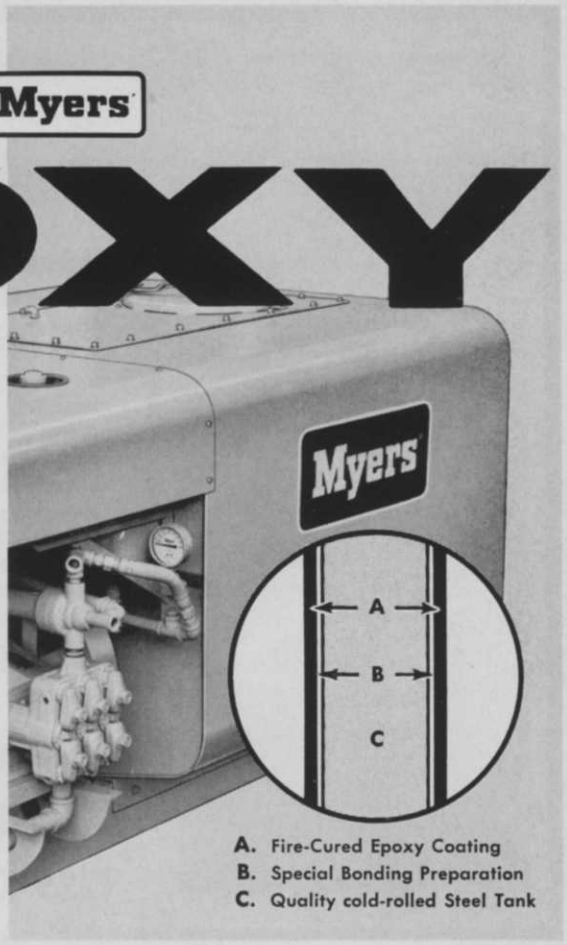

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Highway Spray Survey

(*from page W-11*)

basis and on a county level. Usually the state takes bids on larger jobs, on major highways, and on inter-county contracts. Smaller firms with fewer branches or less extensive equipment are best suited to bid on local projects.

Frequently, large firms which take a statewide job will prefer to subcontract some smaller strips of roadways located miles from their nearest company office. In these cases, local spraymen should investigate the chances for participation on a regular basis with larger outfits which have no office in the immediate area. It's frequently economically infeasible to transport a spray rig several hundred miles to treat an isolated infestation.

Check State Recommendations

Some states issue recommended chemicals, concentrations, and spray schedules to companies which bid on highway jobs. Occasionally, these specifications may even suggest which power spray rigs should be used. Obviously, if a CA is interested in launching a highway treatment service, he should check both state and county highway departments to see if such recommendations are available.

Suppliers can help, too. Most major manufacturers, both chemical companies and equipment firms, offer brochures and pamphlets on roadside spraying. Many of these bulletins are directly slanted to contract work, and will fill in some general voids in the contractor's knowledge of the market.

There are also a number of franchise arrangements open to applicators. Some leasing firms supply local spraymen with equipment big enough to handle highway weed control. Some of these same "parent" organizations will work with neophyte operators to help teach the lessor how to get the job, and how to do it.

Such leasing companies with franchise-holders all over a single state can frequently work out cooperative arrangements which permit each individual firm to operate in its own section.

If large spray rigs are already a part of the CA's equipment, minor adjustments and a few new booms and nozzles can put the firm in a competitive position. With certain chemicals and delicate applications, however, specially developed sprayers are advisable. This is particularly true with some of the new growth-regulating products.

Move into Road Jobs Slowly

As with all new ventures, highway spraying is a market to be entered cautiously. Mistakes can be extremely expensive. Know-how must be gained, either by trial-and-error on small test plots, or by hiring a supervisor whose experience or education guards against costly errors.

But the market is here, today. It's promising and profitable. Knowledge is available from suppliers, universities, and from trained supervisors looking for a good position. Enterprising firms with an eye to the future should look into the highway market to see what opportunities exist for expansion.

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Shrubs Need Antidesiccant, Fertilizer for Winter Aids

Evergreens need to be attended in winter to insure them against death, Purdue University horticulturists point out. And contract applicators should tell their customers of two winter safeguards to protect valuable shrubs.

Since winter sun and drying wind encourage water loss from needles or leaves, and frozen ground prevents roots from drawing water from the soil, evergreens should be sprayed with an antidesiccant or antiwilt spray.

Antiwilt sprays are especially useful on the more tender broadleaved evergreens, such as American holly, Japanese holly, mahonia, and boxwood. Yews and junipers, although more hardy, should also be sprayed.

Shrub roots continue to grow in the winter, and should be fertilized to stimulate this growth and insure an abundance of foliage next spring. One pound of 10-6-4 or 10-6-8 analysis per 100 sq. ft. should be sprayed on the soil surface, hoed gently, and watered.

Tender shrubs should not be fertilized, however, since the additional stimulant may kill the top growth, the horticulturists warn.

Nutro Lawn Food Adds Dacthal

Dacthal has been added to lawn food by Smith-Douglass Co. for pre-emergent crabgrass control.

Marketed as Nutro Crabgrass Killer and Lawn Food, the new product will eliminate crabgrass and give lawns complete feeding through a high-nitrogen formula, the firm claims. Recommended treatment is 1 lb. per 100 sq. ft.

For more information about the new product, write the company at Norfolk 1, Va.

N.C. Has Dutch Elm Disease

First confirmed report of Dutch elm disease in North Carolina has been reported in Greensboro. A preliminary survey by the N.C. Forestry Service indicates several infection points on or in vicinity of the Greensboro Country Club. Entomologists say the disease could destroy all elms in the state if control measures are not initiated promptly.

Know Your Species

JOHNSONGRASS

(Sorghum halepense)

Johnsongrass, introduced from Asia and North Africa as a southern forage crop, is now a noxious weed.

This perennial weed ranges throughout the South and north along the Mississippi Basin to Southern Nebraska and eastward through Ohio to the Atlantic Coast. It is a pest of cultivated lands, meadows and waste places, particularly troublesome along irrigation canals and drainage ditches. It thrives on rich river bottom soil.

Somewhat similar in appearance to Sudangrass (*S. sudanense*), Johnsongrass can be easily identified by its extensive spread of underground lateral stems. These rootstocks are stout with purplish spots, and scales at the nodes (joints). The roots are fibrous and freely branching (1).

Stems are erect, up to 6 feet or more in height (4). The pith inside the stem has a sugary juice. Leaves are alternate, simple, and smooth; 6 to 20 inches long, ½ to 1½ inches wide. The seed-bearing parts, or panicles, are loosely branched, large, purplish, and hairy (2). Seeds (5) are somewhat similar to Sudangrass, but can be distinguished by differences in structures of the pedicel, the short stalk on the seed that joins the seed to the seed head (3). The tip of the pedicel on Johnsongrass seed is knob-shaped, but the pedicel tip on Sudangrass is rectangular.

Noncrop land may be treated with TCA (trichloroacetic acid), dalapon, sodium chlorate, monuron, or diuron. On Johnsongrass that has been plowed, mowed, or grazed closely, 40 to 50 lb. per acre of TCA has given good control. Where no previous treatment has been given, 100 to 200 lbs. per acre normally gives good control. This treatment results in soil sterilization for 30 days to 24 months, depending on the amount applied, the soil texture, temperature, and the amount of rainfall. Dalapon has been effective as a foliage spray with a shorter residual period in the soil. In humid areas 2 applications of 5 lb. per acre, each during early spring, gives excellent control. In more arid regions 2 applications of 20 lb. per acre will be required.

Treatment of this sort will remove Johnsongrass from areas such as industrial sites, tank farms, highways, railroad rights-of-way, and along irrigation ditches. The chemical methods of weed control are proving to be more efficient and longer lasting than the old method of mowing.

Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland.

(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

Mr. Contract Applicator:

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Weed and brush control is our business . . . our *only* business. Ask about Amchem—in lawn and garden, in farm and in industrial herbicide control products. We've been satisfying home owners, farmers and industry for years. Your customers can buy the same kind of satisfaction. Let us help you plan your contract application future.

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Trimmings

Capital idea in lower case. Bob Zorn, who runs "mister Z," Custom Spraying, in Kansas City, Mo., says with justifiable pride that "there's no bigger name than mister Z in industrial weed control in KC." Bob is well known as a pioneer weed controller who got his start in the pest control business when he was 18, having worked with W. B. McCloud and Orkin. But the ambitious mister Z wanted to become a custom applicator ("a field limited only by the applicator's imagination," Bob says). This successful weedman doesn't rest on his laurels, but uses every accessible method to keep "boned-up" on what's new in weed control. We just had a nice letter from mister Z, in which he gives our staff some interesting pointers; later this year we'll have more to say about this veteran operator from the Midwest, and how he earned his stripes as a weed controller.

* * *

West coasters organize. **Another group of contract applicators who've realized the advantages of banding together is the Pesticide Sprayers Association, Inc., with membership centered largely around Portland, Ore. This energetic group, made up of spraymen, suppliers' reps, and city and county workers, meets once a month to talk about mutual problems. Operators who're interested may write Pat Ryan at 5750 S. E. Knight St., Portland, Ore.**

* * *

Really branching out! Got a flyer the other day from Dempsey Sapp of Florida Pest Control & Chemical Co. in Ocala. Dempsey's firm is cultivating the "Spanish Moss control" business, and has built special machinery to combat this enemy of ornamentals, trees, and citrus groves. "Protect your trees from the 'hangman,'" the flyer urges. Dempsey's aggressive firm is barking up the *right* tree, we're sure, and we hope he makes the moss of it!

* * *

New Jerseymen eye turf. **As more and more pest control operators get into lawn spraying, we hear from time to time of PCO meetings which have included turf sessions in the program. Latest of these was the New Jersey Pest Control Association meeting last month (Dec. 19) in New Brunswick, where the members heard talks on both lawn insects and diseases. PCO-lawn sprayman Dave Fleming, of Philadelphia, Pa., told the diversifying operators about the role each industry plays and how the two combine. Rutger's Dr. Spencer Davis was on hand to talk about turf diseases, so obviously the N-J group isn't going after the business half-heartedly!**

* * *

Pickled logic. Spraymen who've been bothered by illogical antipesticide books recently should read the latest *NAC News and Pesticide Review* from the National Agricultural Chemicals Assn. There's a funny take-off on "wrong reasoning," in which the anonymous writer lays most of the evils of the world to pickle-eating. Facts include: "Nearly all sick people have eaten pickles. The effects are obviously cumulative," and "Of the people born in 1839 who later dined on pickles, there has been a 100% mortality." Effective satire which shows how people can twist facts!

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